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CONTEXTUAL CONDITIONS OF ECOLOGICAL CONSUMERISM
A Food-Purchasing Survey

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ABSTRACT: This study seeks to develop an ecological consumption measure based on the Rasch model. At the same time, it also intends to detect contextual conditions that constrain specific food purchases recognized as environmentally significant behaviors. Moreover, it provides information about the environmental impact and consequences of the behaviors that constitute the proposed measure. Questionnaire data from 547 Swiss residents are used to test three classes of contextual conditions: consumer's socioeconomic characteristics, consumer's living circumstances, and store characteristics. With differential performance probabilities as the source of information to detect effective contextual influences on ecological behavior, the findings suggest that ecological consumption is rather susceptible to store and household characteristics but not to socioeconomic features. Furthermore, the conditions under consideration are not uniformly supporting or inhibiting. Instead, they appear to inhibit some behaviors while facilitating others.

Keywords: *behavioral assessment; item response theory; ecological behavior; ecological consumerism*

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Resources and energy are used excessively in food production and distribution, in food packaging and conservation, and when people consume food. Not surprisingly, certain consumption patterns contribute more than others do to environmental degradation, depletion of nonrenewable resources, emissions of greenhouse gases, and accumulations of sewage and waste. Furthermore, current agricultural practices, such as the application of pesticides and fertilizers, have led to dangerous phosphate concentrations in drinking water and to soil erosion, to name just two of the negative consequences. Obviously, by increasing the demand for "green products," consumer behavior can induce a significant shift toward more sustainable agricultural practices. For instance, the growing consumer demand for organically produced food has contributed to an expansion of organic farming in many countries (e.g., Dunlap, Gallup, & A. M. Gallup, 1993). It is clear that understanding what factors lead to more ecological consumer patterns will be crucial in the quest for promoting more sustainable patterns (Stern, 2000a).

Traditionally, environmental psychology has explored the role of personal variables, such as attitudes, beliefs, norms, or values. This research has contributed to illuminating the significance of personal variables in predicting ecological behavior but has paid rather little attention to contextual influences, such as density of recycling bins or availability of public transportation (e.g., Hines, Hungerford, & Tomera, 1986/1987). Yet other researchers have provided evidence that, not surprisingly, the features of the situation in which a performance takes place also matter (Black, Stern, & Elworth, 1985; Guagnano, Stern, & Dietz, 1995; Kaiser & Keller, 2001; Stern, 2000b; Tanner, 1999). Other studies based on a behavior approach have demonstrated that an effective strategy of behavior change is to change the situationally given circumstances (Geller, 1987; Geller, Winett, & Everett, 1982; McKenzie-Mohr, 2000). Furthermore, as Stern and colleagues (Black et al., 1985; Guagnano et al., 1995) have pointed out, situational or external barriers can block ecological behavior and undermine the influence of environmental beliefs, attitudes, or norms. Such limitations are usually beyond an individual's control as they often derive from sociocultural influences. For example,

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even if a person is motivated to buy green products, he or she cannot readily buy such goods if they are not offered for sale in an accessible location. Equally obvious, it is more difficult to reduce packaging material or to carry out recycling behavior if packaging is an integral part of the product and recycling bins or trash removal services are not accessible in the area.

Conceptually, the present study is based on an approach that holds that human behavior is subjected to numerous barriers, both internal and external (see also Gardner & Stern, 1996; McKenzie-Mohr, 2000). Moreover, we suggest that internal and external barriers intervene at different levels of action (Tanner, 1998, 1999). Specifically, internal barriers are conceptualized as having an influence on people's knowledge and motivation to act. In contrast, contextual barriers affect the possibility of people participating in an ecological action, regardless of the individual's motivation to act. Our claim is that, even though identifying barriers that inhibit or facilitate the performing of an ecological behavior is most crucial, it remains rather understudied in psychological research. Accordingly, our explicit focus in this article is on contextual rather than internal factors of ecological consumer behavior.

Because behavior is susceptible to multiple contextual influences, it is not easy to detect the most powerful ones. Different situational conditions do occasionally interfere with each other. Also, some affect only few environmental behaviors, whereas others influence a multitude of performances concurrently (Bratt, 1999). Hence, from a methodological point of view, we are faced with two challenges: (a) We have to locate the most crucial contextual influences and at the same time (b) we have to measure individual performance reliably and validly. The present article adopts a recently introduced method in approaching both issues simultaneously. We promote a variant of a method that has been used in the past as an efficient way of detecting contextual influences on different ecological behaviors (see Kaiser & Biel, 2000; Kaiser & Wilson, 2000). More specifically, our study examines the role of three arrays of variables in their significance for ecological consumerism: (a) people's socioeconomic conditions (education, employment status, and occupational level), (b) their living circumstances (place of residence, household income, household size), and (c) the characteristics of the store where they usually shop (e.g., supermarket, organic food stores).

CONSIDERATION OF CONTEXTUAL CONDITIONS

The literature reveals three strategies with which to account for contextual influences: (a) replacing contextual with internal variables, (b) considering

external and internal factors jointly and interactively in the prediction of people's behavior, and (c) applying a behavior measure that makes systematic use of behaviors that are differentially affected by context. In the following, we shortly discuss these strategies.

The first strategy refers to a number of studies (e.g., Axelrod & Lehman, 1993; DeYoung, 1990; Grob, 1995) that use concepts, such as perceived behavioral control or efficacy, and explore the significance of these subjective expectations in predicting different ecological behaviors. These concepts obviously deal with the subjective appreciation of barriers, thereby focusing on aspects within the individual. In other words, this research tends to understand ecological performance primarily as a consequence of an individual's subjective view and his or her resulting motivation to act, rather than extending its scope to real constraints on or facilitators of a person's behavior. Moreover, the subjective appreciation of situational influences obviously presupposes the respondent's ability to recognize and verbalize actual barriers to a particular behavior. However, it is possible that effective barriers are not yet salient as barriers at all. How accurately perceived behavioral control relates to actual barriers is another issue that remains to be resolved.

Following the second strategy, some (Black et al., 1985; Guagnano et al., 1995; Stern & Oskamp, 1987) attempted to explore actually existing contextual barriers and studied the role of socioeconomic background variables, such as available infrastructure and economic forces, in predicting ecological behavior. Generally, this research has illuminated the significance of external forces in inhibiting the impact of internal factors. For example, in a study of different types of energy-conservation behaviors, Black and colleagues (1985) found that contextual conditions were the most important predictors in so-called high-cost behaviors (i.e., investing in home insulation), whereas context was of only minor significance in so-called low-cost acts (i.e., turning off the heat in unoccupied rooms). Overall, this line of research provides ample evidence for the fact that contextual constraints on and facilitators of people's behavior do exist. Yet it also demonstrates that the impact of external influences varies with different behaviors and with different people (cf. Gardner & Stern, 1996; McKenzie-Mohr, 2000). Given that the impact of contextual barriers is behavior-specific, research in this area is commonly limited in scope, scrutinizing only a few potential influences and/or exploring only a few performances. One efficient way to avoid this limitation and to test simultaneously the effects of several contextual factors on a multitude of behaviors requires the application of an unconventional approach to the measurement of behavior that is not based on correlations and the commonly used factor analytical procedures (see Kaiser, 1998). This is done by using an

application of the Rasch model with the measurement of behavior. That is the third strategy.

In essence, a behavior measure using the Rasch model is based on the assumption that contextual circumstances can create obstacles and aids that make behaviors more or less likely to be performed (cf. Kaiser & Keller, 2001). For example, the acquisition of solar panels is typically quite rare because it depends on major conditions, such as house ownership or significant financial investment. In contrast, paper recycling is much more likely to occur because communities facilitate it with free pickup programs and sometimes also by charging fees for household garbage collection. If only a few people behave in a certain way or, that is, if the performance probability is low, we are dealing with a difficult behavior, such as the installation of solar panels. Note that such an assessment of the difficulty of a behavior is not derived from people's reflections and self-reporting of external barriers. Rather, it represents the linear equivalent of the endorsement probability of a behavior in a given sample, which is technically the natural logarithm of the endorsement-nonendorsement ratio or the odds of endorsement (see Bond & Fox, 2001). Strictly speaking, a behavior difficulty is equivalent to the likelihood that anyone will behave in a certain way, regardless of his or her specific attitude or motivation to act. Consequently, the more likely it is that people will manifest the behavior in question, the fewer situational obstacles can be assumed and vice versa. The less likely it is that people will manifest the behavior in question, the more contextual impediments can be expected. For example, purchases of organic products will be relatively rare when there is a scarcity in the area of organically grown food products. Comparing endorsement probabilities in different contexts has recently been proposed for use as a "diagnostic" tool for disclosing contextual influences responsible for facilitating or inhibiting certain behaviors (Kaiser & Biel, 2000; Kaiser & Wilson, 2000).

A person's performance level is, in turn, assessed by the difficulties he or she actually overcomes (cf. Kaiser, 1998). The more increasingly difficult tasks someone masters, the more this person generally behaves ecologically. Conversely, the level of a person's ecological behavior tends to be low when the tiniest difficulty is enough to restrain him or her from action. In applications of the Rasch model, all behaviors under consideration fall on one dimension and can be distinguished purely quantitatively on the basis of their item difficulties. Because the Rasch model represents a probabilistic and not a deterministic model, people are free—to some extent—to behave inconsistently. For instance, someone who behaves ecologically on a very high level in general may nevertheless buy some convenience foods, even if this behavior could easily be avoided. The model states that the endorsement of a

particular act is an additive function of a person's overall ecological performance (i.e., the so-called person ability) and the difficulty of the very specific behavior. Within item response theory, the Rasch model represents the one-parameter logistic model (for details, see Embretson & Reise, 2000; for an introduction, see Bond & Fox, 2001).

ECOLOGICAL FOOD CONSUMPTION AND ENVIRONMENTAL IMPACT

In considering environmental consequences of sustainable consumption, a remarkably high number of studies have focused on packaging and recycling (e.g., Ebreo, Hershey, & Vining, 1999; Mainieri, Barnett, Valdero, Unipan, & Oskamp, 1997; Vining & Ebreo, 1992). Although packaging is certainly relevant, other ecologically significant product features are worth considering. In recent years, so-called life cycle assessments have become relevant tools for calculating the environmental impact of food products both on resource and energy use and on the extent of harmful emissions associated with food production, transportation, packaging, and consumption. According to this research, agricultural practice, transport distances, and conservation methods are also important product dimensions to consider (Jungbluth, 2000; Jungbluth, Tietje, & Scholz, 2000).[1] For example, an analysis of the environmental impact of Swiss food products revealed that greenhouse production of vegetables creates more environmental burdens in terms of energy and resource use than does open-air production; in addition, the impact of vegetables shipped to Europe across the Atlantic is 8 times more negative than the impact of domestically-grown vegetables (Jungbluth, 2000; Jungbluth et al., 2000). Overall, we can assume that organically grown, seasonal, unwrapped, fresh, and domestic food products cause less environmental burdens than conventionally grown, wrapped or frozen goods, or goods transported over long distances.

The present research attempts (a) to develop a new ecological food purchase measure based on the Rasch model and (b) to illustrate how such a measure can be used to search for potentially significant contextual barriers to people's performance. This article also aims to validate the environmental significance (i.e., the ecological footprint) of different food consumption behaviors (see Oskamp, 2000). More specifically, the behaviors that constitute our ecological consumer behavior measure will be checked for their environmental consequences. This will be accomplished by comparing self-reported consumption patterns with their calculated environmental impacts

based on life cycle assessment, an enterprise that is unique in environmental psychological research. This was only possible due to collaboration with life cycle assessment experts.

METHOD

PARTICIPANTS AND PROCEDURE

Survey data of rural and urban households in and around the city of Bern, Switzerland, were collected in November 1996. For 6,500 randomly selected households, the household's primary shopper was asked to volunteer. Then, 745 questionnaires were sent to those who had returned a consent form (response rate: 12%). Of these, a total of 547 German-speaking Swiss adults returned the completed questionnaire. Respondents' mean age was 47 years (range: 18 to 90 years); 59% lived in the city of Bern, and 41% lived in rural settings. We checked the representativeness of our sample by comparing its composition with census data from the Swiss Statistical Yearbook 1997. This showed quite a good match. Noteworthy differences were related to gender, household size, and education. Not surprisingly, the proportion of women in our sample (68%) was found to be higher than in the Swiss population at large (51%). This indicates that shopping on behalf of the household is still done more by women than by men. Compared to the Swiss population, our sample had a somewhat smaller percentage of single-person households (20% vs. 32%) and a larger proportion of people with higher education (45% vs. 30%).

MEASURES

Contextual conditions. Ten questions were used as indicators of contextual barriers. In regard to stores, we asked participants where they "mainly" buy milk products, vegetables, and meat. Respondents could choose among numerous options that constitute a broad array of possible shopping opportunities in Switzerland, such as supermarkets and smaller retailers, organic food stores, farmer's markets, farmers, fair-trade stores, and health food stores as well as food procurement by self-production. The scores were combined in an index of frequency of supermarket use that ranged from 0 (*no supermarket*) to 3 (*exclusively supermarkets*). Finally, the questionnaire included questions assessing the respondent's socioeconomic characteristics (education, occupational level, employment status, and household income) and household living conditions (place of residence, household size).[2]

Ecological consumer behavior. This measure was originally composed of 26 items. Most of the items included in the behavioral measure referred to purchases of food products varying in environmentally relevant product characteristics, such as means of production, packaging, type of preservation, and origin. Some items were derived from preliminary interviews with a sample of supermarket and organic food store customers. Respondents were asked how often they buy different kinds of food products, such as canned food, products with an eco-label, frozen meat, and fresh produce. In addition, 4 items referred to purchases of brands produced in the local area. One item addressed the purchase of fair-trade products (products that guarantee fair prices and working conditions for workers).[3] We also asked respondents to estimate how many liters (1 liter = 1.8 pints) per week they buy of different beverages, such as imported beer or milk bought in bulk.

The original 6-point response format had to be revised into a dichotomous response format, combining "less than once a week" or "less than 10 liters per week" responses into "not purchasing ecologically" and turning "more than once a week" or "more than 10 liters per week" answers into "purchasing ecologically." This dichotomous measure was indicated because the more sophisticated response format made responses more arbitrary rather than more reliable.[4]

When all 26 behaviors and all participants ($N = 547$) were calibrated by using the Rasch model, the scale had a separation reliability of $r = .70$ (internal consistency: Cronbach's $\alpha = .69$). Seven items had to be excluded due to poor item fit (t-value [t] ≥ 2.6). Among those were, interestingly, all items referring to locally grown items.

For the remaining 19 items (shown in Table 1), the separation reliability turned out to be low but acceptable, $r = .61$ (internal consistency: Cronbach's $\alpha = .60$). In addition, the combined fit statistics of the scale are quite reasonable: mean of mean square, M (MS) = .99, standard deviation of mean squares, SD (MS) = .08, mean of t-values, M (t) = –.12, standard deviation of t-values, SD (t) = 1.34. Ideally, M (MS) and SD (t) should be 1.0, whereas M (t) should be 0. For SD (MS), no general reference value is given. Six of 547 participants (1.1%) did not fit well ($t \geq 2.6$). The combined fit statistics for the participants are: M (MS) = 1.0, SD (MS) = .40, M (t) = –.03, SD (t) = 1.14. For six cases, no overall performance score could be calculated because of zero or perfect response patterns. In sum, the fit statistics and reliability information for the ecological consumption measure are acceptable.

To assess which ecological purchases are harder or easier to perform under what circumstances, we compared different groups of people in respect to differential performance probabilities. In Table 1, the behaviors are ordered according to their endorsement probability, which relates to the

TABLE 1
Ecological Consumer Behaviors Ordered by Endorsement Probabilities (*N* = 541)

Behavior	p
Purchases of unbottled milk	.18
Purchases of fair-trade products	.22
Purchases of milk in plastic packaging	.24
Purchases of milk in a cardboard carton (-)	.51
Purchases of products with an eco-label	.52
Purchases of meat from humanely kept animals	.53
Purchases of organically grown food	.57
Purchases of open cheese	.64
Purchases of packaged cheese (-)	.82
Purchases of exotic fruits (-)	.89
Purchases of fresh, locally grown vegetables	.90
Purchases of imported beer (-)	.90
Purchases of convenience foods (-)	.91
Purchases of canned food (-)	.93
Purchases of frozen meat (-)	.96
Purchases of frozen fish (-)	.97
Purchases of frozen vegetables in summer (-)	.99
Purchases of fish in cans (-)	.99
Purchases of meat in cans (-)	.99

NOTE: (-) indicates that the behavior is unecological and was therefore recoded. *p* represents the endorsement probabilities for a person with an average overall performance level.

number of persons who manifested the behavior in question. Thus, a behavior at the top of the list indicates that only relatively few persons manifested this behavior. In contrast, an item at the bottom of the list indicates that almost everyone manifested that behavior.

Environmental impact. To get information about the environmental consequences that go along with a person's consumption, data from a diary study were included. This second study was undertaken with a subsample ($n = 135$) 1 year after the original survey. For the present research, it is sufficient to know that participants were asked to record their purchases of meat and vegetables over 4 weeks. In addition, consumers had to report products' attributes, such as agricultural practice, preservation method, packaging, and origin.[5] Based on these characteristics, life cycle assessment experts estimated the environmental impact associated with these purchases. These calculations covered the amount of harmful environmental consequences of a product that result from production, packaging, conservation practice, and transport. The environmental impact measure takes account of factors such as fertilizer and

TABLE 2
Correlation Matrix of Seven Contextual Features

	1	*2*	*3*	*4*	*5*	*6*
1. Residence						
2. Household size	.31***					
3. Household income	–.03	.25***				
4. Occupational level	–.16**	–.17**	.35***			
5. Education	–.13**	–.11*	.24***	.35***		
6. Employment status	–.13**	–.19***	.07	.09*	.25***	
7. Supermarket use	–.22***	–.15**	–.07	–.00	–.00	.03

NOTE: The sample sizes vary between $N = 458$ and $N = 547$.
*$p < .05$. **$p < .01$. ***$p < .001$.

pesticide use, emissions of greenhouse gases, and heavy metals or carcinogens, to name just a few (for details, see Jungbluth, 2000; Jungbluth et al., 2000).

RESULTS

We will report our findings in two sections. First, the environmental impact assessment of the ecological behavior measure will be presented. Second, the exploratory search for effective contextual conditions is detailed.

PURCHASES AND THEIR ENVIRONMENTAL CONSEQUENCES

Correlating people's overall ecological consumption with the ecological footprint that derives from that consumption revealed a noteworthy relation between the two, $r = –.36$ ($p < .001$). That is, a high level of self-reported ecological behavior tends to coincide with less harmful environmental consequences. It is important to note that the comparison is somewhat limited because the diary study, unlike the questionnaire, contains no records about purchases of milk products. Although the correlation is only modest, this finding clearly demonstrates the environmental significance of our consumption scale.

CONTEXTUAL INFLUENCES ON CONSUMPTION

To assess the association among the three groups of contextual variables, bivariate correlations were calculated (see Table 2). Not surprisingly, some significant but moderate correlations can be reported among the socio-

TABLE 3
Differential Consumer Patterns Among Different Groups of People

Dimensions	*Groups Compared*	*Number of Items That Differed Significantly*[a]
Socioeconomic characteristics		
Education	Low vs. high education	0
Occupational level	Low vs. high rank	2
Employment status	Housewife vs. Full-time employment	0
	Retired vs. full-time job	1
Household income	Low vs. high	0
Living circumstances		
Residence	Urban vs. rural	6
Household size	Single vs. more than two persons	5
Stores	Nonsupermarket vs. supermarket	6

a. Refers to the number of behaviors with significantly ($p < .01$) differential endorsement probabilities among the compared groups.

economic characteristics ($p < .001$). More interestingly, place of residence, household size, and frequency of supermarket use are also related. Unlike rural households, urban households tend to be smaller in size and to do their shopping more frequently in supermarkets.

Assuming that variation in endorsement probabilities represents valid information about essential contextual influences (for supporting evidence, see e.g., Kaiser & Keller, 2001), we searched for differential performance probabilities across groups of people. Specifically, we compared groups that differed on our contextual dimensions (e.g., urban vs. rural residents, supermarket vs. nonsupermarket users). As noted earlier, each such empirically detected difference in the endorsement probabilities is supposed to originate in situational factors that constrain or facilitate people's behavior.

Table 3 gives the number of behaviors (out of 19) for which significant group differences could be found, $\chi^2(1) > 6.63$, $p < .01$, according to tests for item parameter invariance. Note that statistical comparisons were performed only between groups at the extremes along each context dimension. For instance, single households were compared solely with households of more than two persons, low-income households only with high-income households, and regular supermarket customers only with people who never shop in supermarkets. As can be seen in Table 3, place of residence and store type

accounted for 6 discrepancies in purchase behavior probabilities and household size for 5. Job rank accounted for two discrepancies and employment level for only 1 discrepancy. Binomial tests were also carried out to account for the possibility that the results can be significant by chance. We tested the likelihood of getting at least 0, 1, 2, 5, and 6 tests out of 19 significant ($p < .05$). Although living circumstances (at least 5 and 6 out of 19) and store type (at least 6 out of 19) seem likely to be valid contextual influences ($p = .002$ and $p = .0002$, respectively), all socioeconomic effects can be attributed to chance, which is indicated by the nonsignificant binomial tests (at least 0, 1, and 2 significant tests out of 19 represent probabilities of either $p = 1.0$, $p = .63$, or $p = .25$).

Overall, we found that living circumstances and store type turned out to be crucial situational influences. In contrast, socioeconomic factors revealed no striking pattern of differential performance probabilities, despite the fact that they yielded some significant results (which may have been significant by chance). Unexpectedly, differences in household income turned out to be neither a supporting nor a constraining condition for any ecological consumption performance.

Table 4 depicts the specific purchase behaviors that appeared to be affected by context, $\chi^2(1) > 6.63$, $p < .01$, according to tests for item parameter invariance. We focused only on those conditions that we had already detected as generally influential in affecting endorsement probability (i.e., place of residence, store type, and household size).

Compared to rural environments, urban environments make it harder to buy minimally packaged products (i.e., unbottled milk, unpackaged cheese). Conversely, for urban residents it is easier to get labeled products (marking such categories as organically grown food, meat from humanely kept animals, or fairly traded goods). This result indicates a better supply of labeled products but a lack of availability of unpackaged goods in urban stores. In regard to stores, although supermarkets hinder people also in the purchase of minimally packaged products, they were found to be a facilitator in purchasing meat from humanely kept animals as well as in buying fresh produce. Similarly, for single households it appears to be harder to get unpackaged products but easier to get organic edibles and to avoid canned food. Given the interrelatedness among some of the contextual conditions (as shown in Table 2), it is very likely that at least some of the purchase differences originate in the differential availability of certain types of stores and the differential supply of goods in different areas. Moreover, the conditions under consideration revealed no uniformly supporting or inhibiting situational conditions. Instead, each one appears to inhibit some behaviors while facilitating others.

TABLE 4
Particular Purchase Differences Among Different Groups

Group Comparisons	*Items*	*Standardized Differences*	χ^2
Urban vs. rural residence	Unbottled milk	8.62	74.31***
	Fair trade products	–2.79	7.77**
	Milk in plastic packaging	–3.38	11.42***
	Products with an eco-label	–4.24	18.00***
	Organically grown food	–3.55	12.60***
	Fresh, locally grown vegetables	–5.66	32.07***
Single vs. households with more than two persons	Unbottled milk	4.19	17.53***
	Meat from humanely kept animals	2.69	7.22**
	Organically grown food	–3.14	9.85**
	Open cheese	2.68	7.20**
	Canned food (-)	–3.15	9.94**
Nonsupermarket vs. supermarket stores	Unbottled milk	–2.97	8.80**
	Milk in plastic packaging	5.01	25.07***
	Meat from humanely kept animals	2.73	7.47**
	Open cheese	–2.72	7.38**
	Packaged cheese (-)	–3.48	12.14***
	Fresh locally grown vegetables	4.68	21.30***

NOTE: (-) indicates that the behavior is unecological and was therefore recoded. Standardized differences: A *positive value* means that the corresponding behavior is less likely for urban residents, single households, and nonsupermarket customers. A *negative value* means that the corresponding behavior is less likely for rural residents, households with more than two people, and supermarket customers.
**$p < .01$. ***$p < .001$.

DISCUSSION

Our results provide little evidence that differences in social status or household income affect a broad range of consumers' ecological behaviors. This may point to the fact that monetary dimensions, at least for this Swiss sample, play a less dominant role than may be expected. Obviously, food purchases are less expensive than, say, the adoption of new technology (e.g., investing in home insulation). Although differences in price do not make such a difference in low-cost behaviors, the relative importance of money is likely to increase in high-cost activities (Black et al., 1985).

Our findings confirm that consumer behavior is most strongly influenced by conditions that are related to residential environment, store features, and

household size. It is likely that the various endorsement probabilities reflect differences in the supply of ecological goods. In terms of specific food purchases, it is noteworthy that the distinct environmental conditions appeared to have an impact primarily on just two distinguishable arrays of purchases, namely, purchases of minimally packed goods and of labeled products. Among other findings, urban and supermarket environments appear to discourage purchases of minimally packaged milk products compared to rural environments and alternative stores (e.g., organic food stores). In contrast, urban environments and supermarkets make it easier to get labeled goods. This may indicate that supermarkets foster more ecologically relevant product labeling.

Of course, subsequent research is still needed to identify other kinds of external factors that might have a decisive effect on ecological food purchases. Furthermore, not only is behavior likely to be susceptible to multiple contextual influences, but these conditions themselves are interrelated and appear to be organized at distinct hierarchical levels. The conditions explored in the study were based on our still quite preliminary understanding of contextual conditions. To be of additional use for interventions, further research should be conducted to clarify the specific situational circumstances that are correlated with different residential locations and with particular store types. For instance, different performance probabilities tied to various stores may derive from differences in the range of products supplied and/or other characteristics (i.e., image or atmosphere).

Importantly, our study showed that some contextual conditions can hinder some behaviors while promoting others. This suggests that contexts operate differentially as either a constraint on or a facilitator of different behaviors. For instance, urban environments seem to make it harder to avoid packaged products, whereas they appear to make it easier to get labeled food products.

These findings point to at least two implications regarding interventions: First, for Swiss consumers essential constraints on ecological food consumption are more likely to arise from residential environments and store features than from socioeconomic differences. Effective programs or policies intended to promote ecological consumer behavior should not only rely on price incentives but also try to reduce those nonmonetary constraints. For instance, it would appear to be more effective to foster the availability of unpackaged products in urban areas and labeled products in rural ones. Note that eco-labels provide ecologically relevant information for the consumers. Second, programs designed to change contextual conditions should take into consideration the fact that the same condition might function as a constraint as well as a facilitator. That is, implemented strategies may positively affect

some behaviors, whereas they may turn out to be ineffective or even counterproductive for others.

One limitation of this study concerns the ecological food purchasing scale. We had to exclude some behaviors that seemed not to address ecological consumerism but rather to support regional food production. On one hand, this diminished the reliability (from $r = .70$ to $r = .61$), but, on the other hand, it improved the overall fit statistics of our measure. Despite its ecological validity, its reliability and internal consistency are not fully satisfactory. Further research is needed to improve the measurement qualities of the newly proposed measure. It is noteworthy that the correspondence between the consumer behavior measure and the assessment of environmental impact supports the environmental significance (its ecological validity) of the scale even though the moderate strength of the relationship asks for further improvements. In addition, the findings apply most directly to the Swiss sample and their economic and social conditions. The conditions and behavioral items used in the study can be traced, at least partially, to culture-specific factors. However, although this limits the generalizability of the results, it simultaneously increases their practical relevance.

We believe that the methodological approach used in this study is an efficient and promising way to address contextual influences. Its main advantage is that it allows one to study simultaneously the influence of multiple external conditions on numerous behaviors. This helps to clarify the range of distinct behaviors to which a particular factor may apply, and it allows the identification of both constraining and facilitating conditions. Finally, we want to emphasize the importance of employing information about the environmental significance of the behaviors studied. To be of use in solving environmental problems, it is crucial to know which behaviors should be assumed to be ecologically advantageous and which behaviors make a difference regarding resource use (Stern, 2000a). In this study, assessment of the environmental consequences of the behaviors studied became possible due to interdisciplinary collaboration with life cycle assessment experts. Obviously, information about environmentally significant behaviors provides essential criteria for the further developments of behavioral measures.

Overall, we believe that the application of the Rasch model to the measurement of behavior has proved to be useful in detecting crucial contextual conditions, in revealing their inhibiting or facilitating quality, and in helping to induce practical consequences on how to support environmental consumerism. We also hope that the study provided evidence of the enrichment that may come from interdisciplinary collaboration.

NOTES

1. Life cycle assessment (LCA) is a well-established method to calculate the overall environmental impact of a service or a product throughout its entire life cycle. An analysis of the food sector covers the whole production-consumption chain from farming through trade, sale, and consumption to disposal.

2. An additional relevant socioeconomic dimension would have been personal income. Although this variable was originally part of the survey, it was dropped from subsequent analyses due to missing values.

3. Recent literature suggests fair trade as another feature of sustainable development. In fact, some researchers report that a fast-growing segment of consumers rewards organizations that guarantee fair prices and working conditions to growers and coffee workers (Abramovitz et al., 2001). In our interviews with consumers from different stores, we also found evidence that fair trade is perceived as a relevant product feature and as being related to sustainability.

4. Obviously, the variety of possible responses was reduced by converting the polytomous response format into a dichotomous one. A polytomous response format, however, does not necessarily enhance a behavior measure's reliability as it actually can add nuisance rather than meaningful variance (e.g., Kaiser & Wilson, 2000).

5. Obviously, packaging and conservation method are salient product features. At least for Swiss consumers, organic production is also explicitly indicated by labels. The identification of a product's origin can sometimes be more difficult. Such information is mostly displayed on the package label (e.g., Swiss chicken, strawberries from Spain). In other cases, though, interested consumers have to make an effort to acquire such information, for example, by asking store representatives.

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